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EXAMINER
COMAS, YAHVEH

ART UNIT	PAPER NUMBER
2834	

DATE MAILED: 10/21/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/083,188	TOBA, AKIO	
	Examiner	Art Unit	
	Yahveh Comas	2834	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *06 August 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-22* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☐ Claim(s) *1-12* is/are rejected.

7)☐ Claim(s) *13-22* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

Applicant's arguments with respect to claims 1-22 have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

1. Claim 1-3, 6, 9 and 11-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nihei et al. U.S. Patent No. 4,945,268 in view of Miwa et al. U.S. Patent No. 4,594,520 and in further view of Andoh U.S. Patent No. 5,130,583.

Nihei discloses a linear motor comprising a comprising a stator having two stator pieces pairs (1), and each stator piece pair is composed of two stator pieces (11 and 15) which are parallel-placed rail-shaped magnetic substance having a plurality of projections arranged at a regular spacing T in a longitudinal direction, a bridge made by magnetic substance connecting one end of each stator pieces together magnetically, and a coil wound (6 and 17) around the bridge to magnetize the two stator pieces for opposite polarities, and a mover having a magnetic core and magnetic poles formed on a portion of the magnetic core facing to said stator having a mover (3) piece comprising a magnetic core and a magnetic pole formed on a portion of the magnetic core facing to said stator piece and arranges such that all or part of the N poles faces to projections of the stator when all or part of the S poles face to slots between the projections, wherein in each of two sets of one stator piece pair (11 and 15) and one mover piece (3) facing to each other, two sets of a stator piece and a mover piece facing to each other are arranged such that position to the projections on the stator pieces are sequentially shifted relative to those of the other set by T/2 in the longitudinal direction of said stator (1). The positions of the magnetic poles on the mover pieces (3) to the projections of magnetic poles on the mover pieces (3) to the projection on the stator pieces (11 and 15) are sequentially shifted relative to each other at a regular spacing along the longitudinal direction of said stator (1), and a thrust along the longitudinal direction of said stator can be produced on said mover by sequentially applying an electric current to a coil of each stator piece pair in a time series.

However, Nihei doesn't disclose that the mover piece pair is composed of two mover pieces which are faced at predetermined spacing to said two stator pieces one to one which comprise said stator piece pair and said mover being longer than the stator.

Regarding the mover comprising two mover pieces which are faced at predetermined spacing to said two stator pieces one to one which comprise said stator piece pair Miwa discloses a coil (47 and 48) wound around at an end portion of a longitudinal direction and the use of a mover (62) with a two set of teeth facing each stator piece (37-40) side of the stator for the purpose of providing a linear motor which can be smaller and suitable for various terminal equipments. The stator piece pair and one mover piece pair facing each other are arranged such that position to the projections on the stator pieces are sequentially shifted relative to those of the other set by T/2.

Regarding said mover being longer than the stator Andoh discloses a mover (202) being smaller than the stator (203) for the purpose of providing the displacement of the mover in the longitudinal direction of the stator.

Therefore, it would have been obvious to one having skill in the art at the time the invention was made to modify Nihei's invention since was know in the art that provide a mover with a two set of teeth facing each stator piece for the purpose of provide a linear motor which can be smaller sized and suitable for various terminal equipments.

2. Claim 4, 7 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over, Nihei et al. U.S. Patent No. 4,945,268, Miwa et al. U.S. Patent No.

4,594,520, and Andoh U.S. Patent No. 5,130,583, as applied in claim 3, and in further view of Kanazawa et al. JP Patent No. 02246762 A.

Nihei, as modify above, disclose the claimed invention except for the stator piece pair is formed such that the projections of its two stator pieces face to each other and said mover piece pair is provided between the two stator pieces in the stator pieces pair corresponding to the mover piece pair. However Kanazawa disclose a linear motor comprising a the stator piece pair is formed such that the projections of its two stator pieces face to each other and said mover piece pair is provided between the two stator pieces in the stator pieces pair corresponding to the mover (1) is provided between the two stator pieces in the stator pieces pair corresponding to the mover (1) for the purpose of improve servo characteristic (thrust/weight ratio) in a linear motor (for example fig. 1).

Therefore, it would have been obvious to one having skill in the art at the time the invention was made to modify Nihei's invention and provide a linear motor comprising a the stator piece pair is formed such that the projections of its two stator pieces face to each other and said mover piece pair is provided between the two stator pieces in the stator pieces pair corresponding to the mover piece pair for the purpose of improve servo characteristic (thrust/weight ratio) in a linear motor.

3. Claims 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Nolle U.S. Patent 5,854,521, in view of Andoh U.S. Patent No. 5,130,583 and in further view of Kanazawa et al. JP 02246762 A.

Nolle discloses a stator having three stator pieces, each of which is formed by rail-shaped substance parallel to each other, with one end of the stator

piece magnetically connected, and with a coil situated to each of the stator pieces, and a mover having M mover pieces, which are at predetermined spacing corresponding to said stator pieces, each mover piece having a magnetic core, which is magnetically connected to the cores adjacent mover pieces, and magnetic poles formed on a portion of the magnetic core facing said stator piece and , wherein the M set of a one stator piece and one mover piece facing each other, the positions of the magnetic poles on the mover piece and the stator pieces are sequentially shifted relative to each other at a regular spacing along the longitudinal direction of said stator, and thrust along the longitudinal direction of said stator can be produced on said mover by sequentially applying an electric current to a coil of each stator piece in a time series. Also a bridge to connect the stator pieces magnetically and said coils are also provided at the other end of the stator (see fig. 3). Nolle discloses the claimed invention except for the stator pieces having projections arranged at regular spacing longitudinal direction and the stator being longer than the mover.

However, Kanazawa discloses a linear motor with a stator having stator pieces with projections arranged at a regular spacing in a longitudinal direction and a mover pole unit of permanent magnets in order to improve servo characteristics (thrust/weight ratio).

Regarding said mover being longer than the stator Andoh discloses a mover (202) being smaller than the stator (203) for the purpose of providing the displacement of the mover in the longitudinal direction of the stator.

Therefore, it would have been obvious to one having skill in the art at the time the invention was made to provide projections at the stator pieces as disclosed by Kanazawa since this would had been desirable in order to improve servo characteristics (thrust/weight ratio).

4. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Nolle U.S. Patent 5,854,521, in view of Kanazawa et al. JP 02246762 A, in view of Andoh U.S. Patent No. 5,130,583 and in further view of Nihei et al. U.S. Patent No. 4,945,268.

Nolle, Kanazawa and Andoh substantially disclose the claimed invention but don't teach a mover piece that is configured by closely coupling a core of a strong magnetic substance with a permanent magnet as a magnetic pole.

However, Nihei discloses the use a strong magnetic substance (3) with a permanent magnet as a magnetic pole for the purpose of providing a permanent magnet linear (4 and 5) motor which is able to cancel the magnetic pull force generated between the stator and the mover, vibration and high-speed movement.

Therefore, it would have been obvious to one having skill in the art at the time the invention was made to modify Ota and Onodera and provide a mover piece that is configured by closely coupling a core of a strong magnetic substance with a permanent magnet as a magnetic pole per Nihei for the purpose of providing a permanent magnet linear motor which is able to cancel the magnetic pull force generated between the stator and the mover, vibration and high speed movement.

5. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Nolle U.S. Patent 5,854,521, in view of Kanazawa et al. JP 02246762 A, in view of Andoh U.S. Patent No. 5,130,583 and in further view of Ota JP 62107667.

Nolle in view of Kanazawa, as applied in claim 5, disclose the claimed invention except for a bridge to connect the stator pieces magnetically and the coils provided also at the other end of the stator.

However Ota, discloses a stator (2) having a first bridge to connect stator pieces (21a, 21b and 21c) magnetically and the coils (3a, 3b and 3c) with a second bridge to connect stator pieces (21a, 21b and 21c) magnetically and the coil (3a, 3b and 3c) at the other end of the first bridge since this would had been desirable in order to improve the positioning accuracy

Therefore, it would have been obvious to one having skill in the art at the time the invention was made to provide a first bridge to connect stator pieces magnetically and a coil with a second bridge to connect stator pieces magnetically and a coil at the other end of the first bridge as disclosed by Ota since the positioning accuracy by winding an excitation coil on the legs of an E-shaped yoke.

Allowable Subject Matter

6. Claim 13-22 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, second paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter: The prior art cited (Nihei, Maeda, Miwa, Kanazawa, Ota and

Onodera), in combination or along, teach the claimed invention except for the use a sensor coil wounded in a slot between the projections of said stator pieces, and an absolute position of said mover can be detected based on a change of inductance of the sensor coil made when said mover passes over the sensor coil.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Yahveh Comas whose telephone number is (571)272-2020. The examiner can normally be reached on 8am-5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Darren Schuberg can be reached on 571-272-2044. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

KARL TAMAI
PRIMARY EXAMINER

YC